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moderately good state of the air; and on the 18th, and especially on the 30th, it was seen satisfactorily. The edges of the ball were distinctly traceable down to the inner edge of the bright ring; the projection of the obscure ring having much the appearance of a very dark and distinctly defined belt. Such it was, doubtless, formerly supposed to be; and it is so delineated in Professor Encke's pictures of *Saturn* in the *Transactions of the Berlin Academy for* 1838.

"The dark shading which has for some time surrounded the southern pole appears to me to have formed itself into a more distinct belt than was visible in September. I believe the whole, or very nearly the whole, of this belt is seen, the middle of its breadth being about 12° from the pole, which is comparatively light. On November 30th, the whole region within 30° or 40° of the pole was noticed to have a light greenish blue tint, the tendency to green being more decided than I had before observed. The night was at times very brilliant, and *Enceladus* was distinctly seen.

"The observed semitransparency of the obscure ring has greatly strengthened an idea I have long entertained, founded on its situation and small reflective power, that it may probably be composed of water or some similar fluid; and if this notion be correct, we may reasonably imagine that its condition may be very variable; and, especially, that divisions seen in it at one time may not be recognisable at another. In estimating the degree of its transparency, it must not be overlooked that the light on the portion of the ball, which we see through it, must have passed through its substance *previously* to its reaching the planet, and thus has been *twice* transmitted through it before it comes to us.

"*Wateringbury, December* 1852."

Letter from Rev. W. R. Dawes to Mr. De La Rue.

"Saturday evening was brilliant here, but by no means sufficiently favourable for delicate observations or measurements. I attempted the latter, but with no satisfactory result. The edges of the planet were soft with the requisite power, and their flickering at the webs of the micrometer defied my attempts to get a certain observation. I then tried the double-image micrometer with little better success: two observations of the polar diameter gave 19″·13, and two of the equatoreal gave 20″·56; both too large, I have no doubt, as might be expected from the diffused state of the limbs. These obs. give

$$e = 0{\cdot}06955 = \frac{1}{14{\cdot}38}.$$

"I shall try again under better circumstances, when such are to be had.

"Thanks for the communication of your idea respecting the faint ring. I could enter upon no such niceties on Saturday. But,

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if you will refer to observations I long since made and published, you will find as strong a confirmation of your happy suggestion as you can desire, or are likely to receive from future observations, except under circumstances of rare occurrence. In the *Monthly Notices* for Jan. 1851, page 52, you will find I have said, 'I have always observed that the upper (southern) and more distant portion of the obscure ring is more plainly seen than the corresponding portion on the side nearest to the earth, and also that the projection of it at its minor (misprinted *inner*) axis is considerably narrower than accords with its breadth at the major axis.' In writing at the same time to the *Astron. Nachrich.* (see No. 751), after stating as above, I have added, 'To avoid the irradiation in diminishing its (the projection's) apparent breadth, I have carefully examined this dark line in daylight, and strong twilight, when the air was quiet and the image sharply defined. By comparison of its breadth with that of a spider's-web of the micrometer, I concluded it to be not more than from 0″·2 to 0″·25 at the minor axis, which, for the time of observation, corresponds to a breadth of from 1″·08 1″·35 at the major axis, instead of nearly 2″ as I had measured it. The appearances would be satisfied by supposing that a section of the obscure ring may be somewhat *wedge-shaped*, the thicker edge being outwards, and that a section of the bright ring may also be wedge-shaped, its thickest edge being inwards.

"But all this bears directly on your supposition that the obscure ring is not in the same plane as the others; and the observations are better satisfied by it than by any other hypothesis.* That the projection on the ball is not seen as broad as it ought to be I have always observed, and mentioned it in my last paper with reference to your diagrams of *Saturn*, in which the projection required to be *narrowed* to agree with the view my telescope gives me; and in the beginning of 1851 the difference appeared much greater than it does now, which would agree with your suggestion. I did not, indeed, notice that the *southern* part of the faint ring *encroached* on the *inner edge* of the *bright ring*. But in every other respect nothing could more fully support your hypothesis than the observations which I have uniformly made. Some other things strike me about it, which I have no time to mention now, being obliged to conclude hastily.

"Yours truly,
"W. R. DAWES."

"*Wateringbury, Nov.* 29, 1852."

Second Letter from Rev. W. R. Dawes to Mr. De La Rue.

"While I was writing to you yesterday, it occurred to me that in 1848, while the ring of *Saturn* was invisible, I had observed *two*

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* Mr. De la Rue states, that this hypothesis is founded on his observations of the *encroachment* of the dark ring on the southern portion of the inner bright ring and its apparent *contraction* on the opposite side; also on the circumstance of the apparent ellipticity of the dark ring not being the same as that of the bright rings.

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